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10/015,701	12/17/2001	Kyeong Jin Kim	8733.479.00	6382
30827	7590	07/13/2005	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			RUDE, TIMOTHY L	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	
			2883	
DATE MAILED: 07/13/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/015,701

Applicant(s)

KIM, KYEONG JIN

Examiner

Timothy L. Rude

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.  
 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-9 and 11-29 is/are pending in the application.  
 4a) Of the above claim(s) 6,8,16 and 21-28 is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1,2,4,5,7,9,11-15,17-20 and 29 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.  
 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All b) ☐ Some \* c) ☐ None of:  
 1. ☐ Certified copies of the priority documents have been received.  
 2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) ☐ Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) ☐ Notice of Informal Patent Application (PTO-152)  
 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claims and Claim Objections***

1. Claims 1 and 5 are amended. Claim 3 is canceled. Claim 29 is added.

Objections to claims 1, 5, 11, and 20 are withdrawn.

Claim 29 is objected to because of the following informalities: "dropping liquid crystal on a surface" is either considered not further limiting or it is considered not supported by the Application as originally filed. For examination purposes, dropping liquid crystal on a surface will be considered met by any method of depositing or dispensing liquid crystal on a surface (as opposed to injected through a hole in the sealant).

Appropriate correction is required.

### ***Specification***

2. The disclosure is objected to because of the following informalities: Specification paragraph [0021] states "a step difference between the dielectric frame and the sealant is obtained so that the dielectric frame does not hinder the liquid crystal from being injected. Also, the liquid crystal is formed not by a vacuum injection method but by a dispensing method which does not require a liquid crystal injection hole."

Please note that this is contradictory. If injection is not used, the step difference cannot facilitate injection. Examiner considers the recitation to refer to the step

difference being sufficient to allow liquid crystal movement during switching (during normal operation of the display).

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

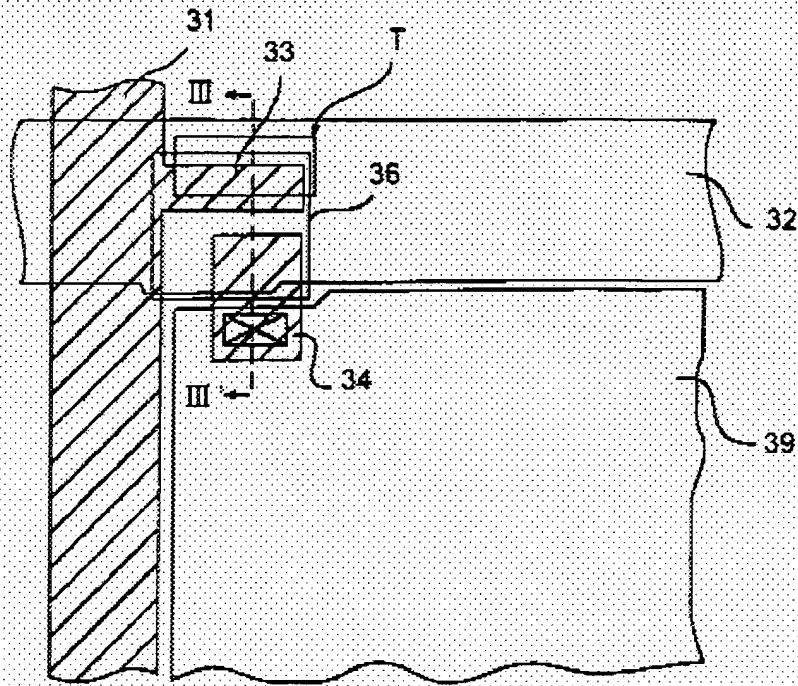
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

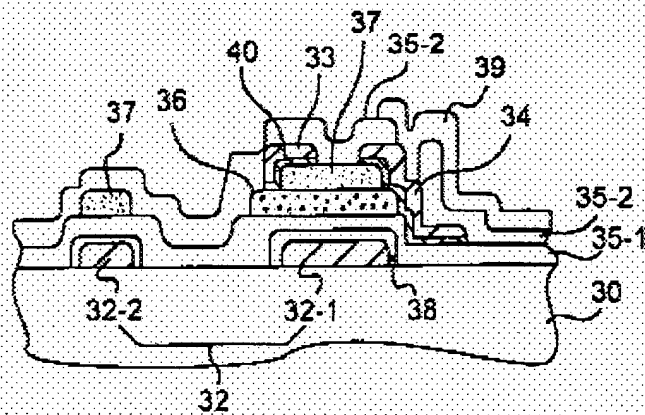
3. Claims 1, 2, 4, 5, 7, 9, 12-14, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh et al (Oh) USPAT 6,130,729 in view of Liu et al (Liu) USPAT 6,573,965 B1 and further in view of Von Gutfeld et al (Von Gutfeld) USPAT 6,055,035.

As to claims 1, 7, and 29, Ohe discloses (Abstract and entire patent) a method of forming a liquid crystal display device comprising: forming an L-shaped thin film transistor (Figure 3A, col. 6, lines 32-37) and a pixel electrode, 39, on a first substrate.

**FIG. 3A**

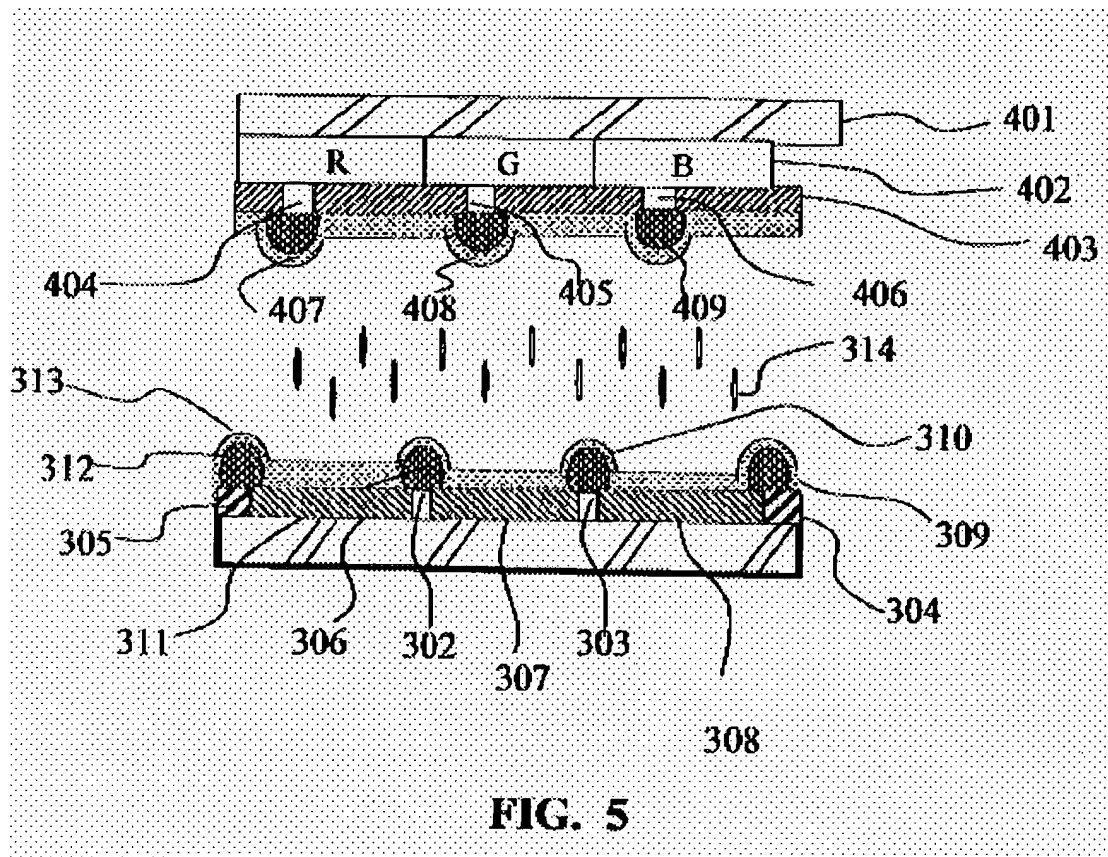


**FIG. 3B**

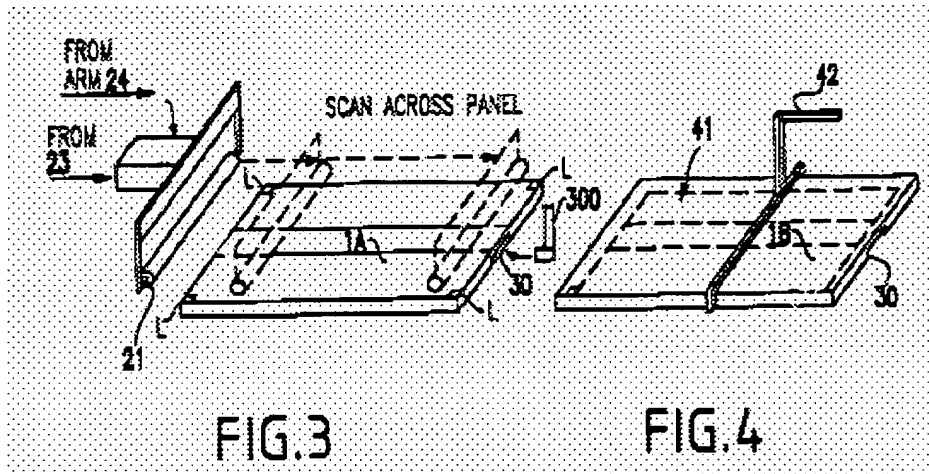


Ohe does not explicitly disclose forming a dielectric frame having a first height and a sealant having a second height on a second substrate, the first height of the dielectric frame being different from the second height of the sealant; dispensing liquid crystal on the first substrate; and attaching the first and second substrates to each other.

Liu teaches (Abstract and entire patent) forming bumps, 311 and 409 (Applicant's dielectric frame) on both substrates (Figure 5, col. 5, lines 45-57, and col. 5, lines 35-44) having a first height and a sealant having a second height (not shown) such that the sealant is taller than the dielectric frame as is evidenced by the gap between the dielectric frames and the opposed substrate (Figure 5) to comprise a multi-domain display with wide viewing angle (col. 2, lines 36-46).



Von Gutfeld teaches uniformly dispensing liquid crystal on discrete areas (pixel areas and non-pixel/non-display areas) of the first substrate (Abstract and entire patent); and attaching the first and second substrates to each other to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly (col. 2, lines 25-34).



Liu is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add a dielectric frame on both substrates having a first height and a sealant having a second height such that the sealant is taller than the dielectric frame to comprise a multi-domain display with wide viewing angle.

Von Gutfeld is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to dispense liquid crystal on the first substrate; and attach the first and second substrates to each other to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh with the dielectric frame on both substrates having a first height and a sealant having a second height such that the sealant is taller than the dielectric frame of Liu to comprise a multi-domain display with wide viewing angle and to dispense liquid crystal on the first



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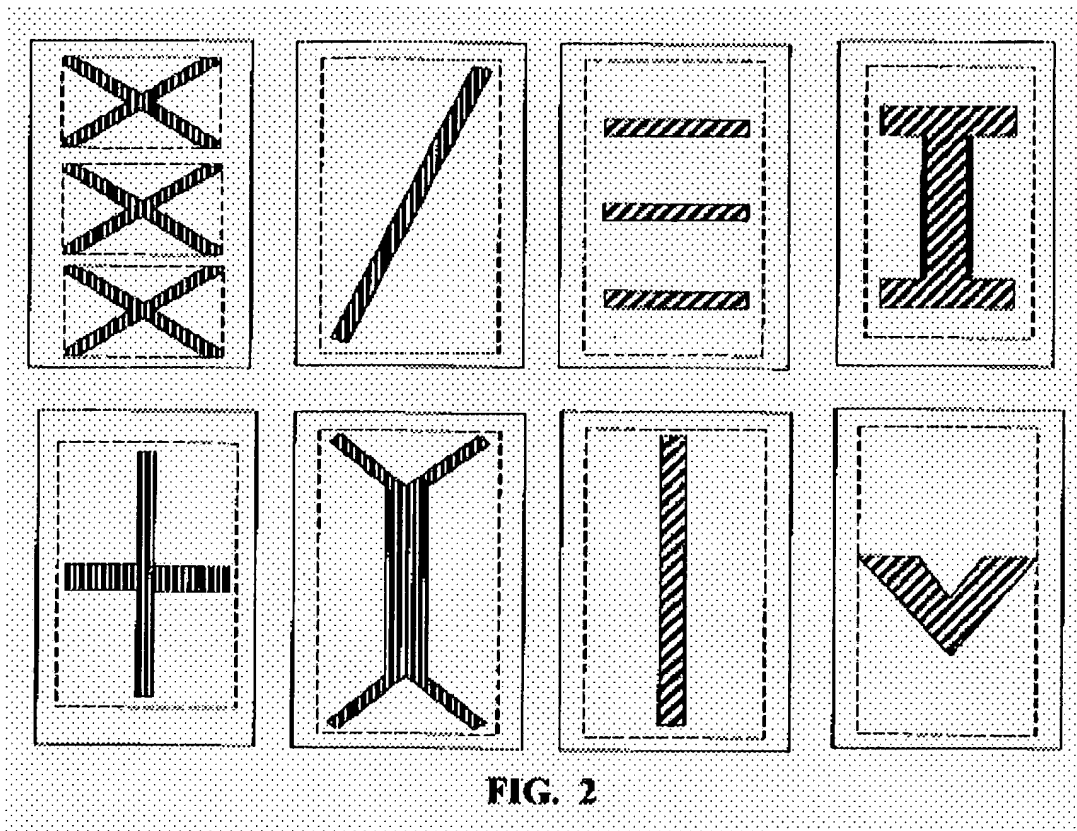
substrate; and attach the first and second substrates to each other per Von Gutfeld to provide a simplified and more efficient method for filling an unassembled LCD panel that is less costly.

Please note that recently added limitations of: wherein the dispensed liquid crystal moves and is uniformly distributed on the first substrate are considered met by any known LCD method of manufacture, since the liquid crystal is liquid and it does ultimately move to become a uniform layer between to substantially parallel substrates. Please also note that Applicant's specification does not support the step of movement of the liquid crystal subsequent to dispensing and prior to mating the substrates.

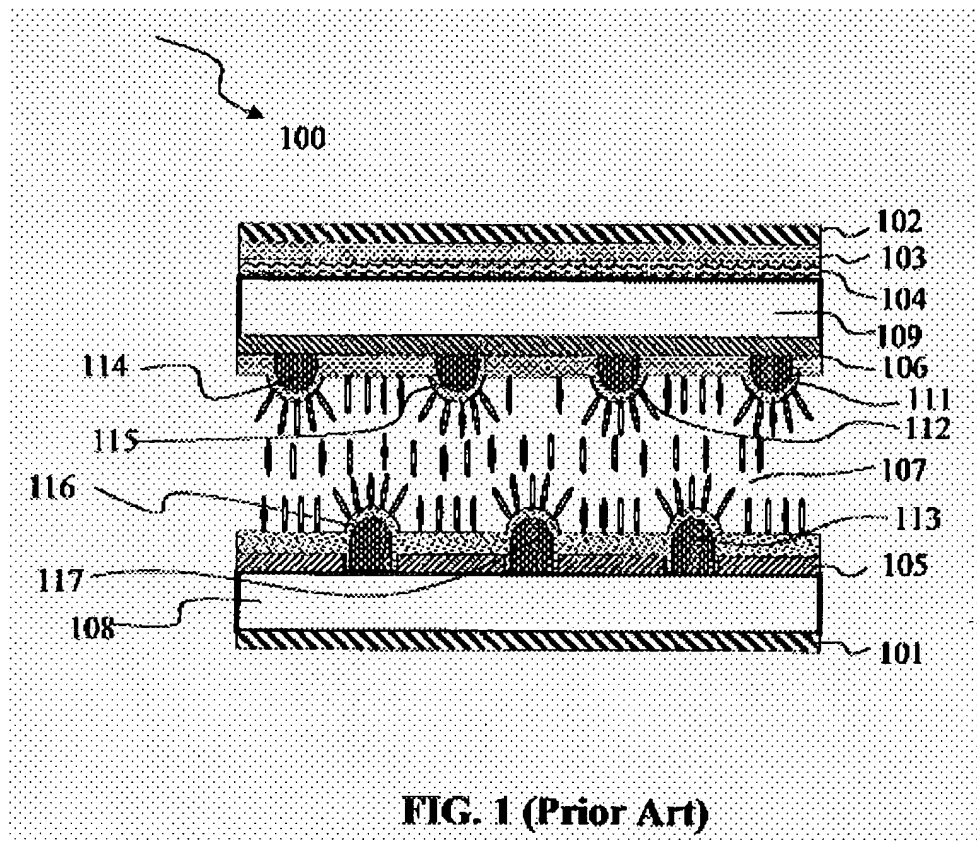
As to claim 2, Von Gutfeld, as combined above, teaches that the sealant includes a material hardened by ultraviolet ray (col. 4, lines 1-4).

As to claim 4 Liu, as combined above, teaches a method further comprising forming electric field inducing slits, 302 and 303 (Applicant's windows), in the pixel electrode, 306~308.

As to claim 5, Liu, as combined above, teaches in Figure 2 a method wherein the electric field inducing window has a slit shape.



As to claim 9, Liu, as combined above, teaches Prior Art in Figure 1 that shows dielectric frames drive the liquid crystal in various directions.



As to claim 12, Oh, as combined above, discloses a method further comprising forming a common electrode on the second substrate (required element, not shown).

As to claim 13, Liu, as combined above, teaches a method wherein the dielectric frame, 409, is formed on the common electrode, 403 (Figure 5).

As to claim 14, Liu, as combined above, teaches a method further comprising forming an alignment layer, 313 and 407, on the first and second substrates (Figure 5).

4. Claims 11 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh, Liu, and Von Gutfeld, as applied to claims above, in view of Kishimoto et al (Kishimoto) USPAT 6,515,718 B1.

As to claims 11 and 20, Oh, Liu, and Von Gutfeld disclose the method above.

Oh, Liu, and Von Gutfeld do not explicitly disclose specific heights of dielectric structures with respect to seal heights wherein a height difference between the sealant and the dielectric frame is more than 1  $\mu\text{m}$  or wherein the first height is a range of 1-2  $\mu\text{m}$  and the second height is in a range of 5-8  $\mu\text{m}$ .

Please note the motivations for establishing cell gap (and correspondingly seal height) were well known in the art at the time the claimed invention was made and include optimization of voltage required, retarder value of liquid crystal layer, and control of liquid crystal mode or configuration.

Kishimoto discloses the motivation to optimize the height of a dielectric structure is to account for the relative dielectric constants of the respective components (col. 18, lines 21-23). In other words, the height is made sufficient to achieve the desired dielectric effect given the relative dielectric strength of the material used.

Kishimoto is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to optimize the results effective variables of

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relative dielectric frame height and seal height to achieve the desired dielectric effect given the relative dielectric strength of the material used.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von Gutfeld with the specific heights of dielectric structures with respect to seal heights wherein a height difference between the sealant and the dielectric frame is more than 1  $\mu\text{m}$  or wherein the first height is a range of 1-2  $\mu\text{m}$  and the second height is in a range of 5-8  $\mu\text{m}$  of Kishimoto to achieve the desired dielectric effect given the relative dielectric strength of the material used (MPEP 2144.05, II, B).

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oh, Liu, and Von Gutfeld, as applied to claims above, in view of Tanaka et al (Tanaka) USPAT 6,603,528 B1.

As to claim 15, Oh, Liu, and Von Gutfeld disclose the method of claim 14.

Oh, Liu, and Von Gutfeld do not explicitly disclose a method wherein the alignment layer is selected from the group consisting of polyimide, polyamide, polyvinyl alcohol, polyamic acid, and silicon oxide.

Tanaka teaches the use of polyimide as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays (col. 9, lines 5-21).

Tanaka is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use polyimide as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von Gutfeld with the polyimide alignment layer of Tanaka as an art recognized material suitable for the intended purpose of forming an alignment film for liquid crystal displays (MPEP 2144.07).

6. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oh, Liu, and Von Gutfeld, as applied to claims above, in view of Kim et al (Kim) USPAT 6,100,953.

As to claims 17-19, Oh, Liu, and Von Gutfeld disclose the method of claim 14.

Oh, Liu, and Von Gutfeld do not explicitly disclose a method comprising formation of a phase difference film, negative uniaxial, or negative biaxial.

Kim teaches the use of negative uniaxial and negative biaxial phase compensation films (Applicant's phase difference films) as suitable means of improving viewing angle performance (col. 5, line 66, through col. 6, line 12).

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Kim is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add negative uniaxial and negative biaxial phase difference films as suitable means of improving viewing angle performance.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Oh, Liu, and Von Gutfeld with the negative uniaxial and negative biaxial phase difference films of Kim as suitable means of improving viewing angle performance.

### ***Response to Arguments***

7. Applicant's arguments filed on 25 April 2005 have been fully considered but they are not persuasive. Applicant's arguments with respect to base claim 1 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's ONLY arguments are as follows:

Dependent claims are allowable because the independent claim is allowable.

Examiner's responses to Applicant's ONLY arguments are as follows:

In so far as Applicant has not argued rationale for rejection of the dependent claims Applicant has thereby acquiesced.

***Conclusion***

Applicant's amendment necessitated any new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L. Rude whose telephone number is (571) 272-2301. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.




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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



tlr

Timothy L Rude  
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